

Education Module

Title:

Investigating Air Quality

Author:

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Grade Level / Subject:

9th – 12th grade Science

Standards:**Science as Inquiry**

- Identify and concepts that guide scientific investigations
- Design and conduct scientific investigations
- Use technology and mathematics to improve investigations and communications
- Formulate and revise scientific explanations and models using logic and evidence
- Recognize and analyze alternative explanations and models
- Communicate and defend a scientific argument

Structure and Properties of Matter

- The physical properties of compounds reflect the nature of the interactions among its molecules

Chemical Reactions

- Radical reactions control many processes such as the presence of ozone and greenhouse gases in the atmosphere

The Interdependence of Organisms

- Human beings live within the world's ecosystems. Increasingly, humans modify ecosystems as a result of population growth, technology, and consumption. Human destruction of habitats through direct harvesting, pollution, atmospheric changes and other factors is threatening current global stability, and if not addressed, ecosystems will be irreversibly affected.

Science and Technology

- Identify a problem or design an opportunity
- Propose designs and choose between alternative solutions
- Implement a proposed solution
- Evaluate the solution and its consequences
- Communicate the problem, process, and solution

Overview:

In this lesson, students will investigate air quality in their community. They will measure and monitor air quality in the community and identify the sources of poor air quality. Students will investigate the impacts of poor air quality on their health and the environment. Students will investigate methods to improve air quality and communicate their results to the community.

Purpose:

The purpose of this lesson is have students study a problem (air quality) in the community, investigate methods of solving the problem and communicate their results to the community.

Learning Objectives:

After completing this lesson, students will be able to:

1. Understand the importance of studying air quality in the community.
2. Identify sources of poor air quality in the community.
3. Understand the impacts of poor air quality on health and the environment.
4. Measure and monitor air quality in the community
5. Identify methods to improve air quality in the community.
6. Communicate results to the community.

Background Skills and Knowledge Required:

1. Use of word processing, spreadsheet and powerpoint programs
2. Use of internet for searches
3. Use of graphing calculators, CBL, probes, graphlink, graphical analysis software

Activities:

1. Show slide show on "Why Study Air Quality"
2. Show slide show on "Ozone"
3. Complete worksheet on "Monitoring Air Pollutants"
4. Complete worksheet on "Understanding Air Pollutants"
5. Complete worksheet on "Statistics"
6. Complete experiment on "Measuring Carbon Dioxide Levels"
7. Complete worksheet on "Analyzing Greenhouse Data"
8. Complete worksheet on "Getting a Handle on Greenhouse Gases"
9. Complete activity "What to do for Powerpoint Presentation"